

THE UNIVERSITY OF CHICAGO

(a) providing a lamp having an outer jacket connected at a single open end thereof to a lamp stem;

(c) inserting a gas dispensing probe into the space enveloped by the outer lamp jacket through the tubular passage in the lamp stem;

(e) dispensing fill gas into the space enveloped by the outer lamp jacket from the gas dispensing probe while providing for passage of gas from the space to the exterior of the outer lamp jacket through the tubular passage to thereby displace a predetermined amount of the gas within the space by the fill gas;

9

(g) sealing the tubular passage to thereby hermetically seal the space enveloped by the outer lamp jacket.

2. The method of Claim 1 wherein the gas dispensing probe substantially coaxial with the longitudinal axis of the lamp.

3. The method of Claim 1 including the step of maintaining the pressure of the fill gas at substantially atmospheric pressure while modifying the temperature of the fill gas relative to room temperature at the time the space enveloped by the outer jacket is hermetically sealed so that the pressure of the fill gas sealed within the space will differ from atmospheric pressure when the fill gas returns to room temperature.

4. The method of Claim 3 wherein the temperature of the fill gas is elevated relative to room temperature at the time the space enveloped by the outer lamp jacket is hermetically sealed so that the pressure of the fill gas sealed within the space will be subatmospheric at room temperature.

5. The method of Claim 4 wherein the pressure of the fill gas sealed within the space enveloped by the outer lamp jacket is less than about 150 torr.

6. The method of Claim 4 further comprising the step of heating the lamp in an oven prior to the step of sealing the tubular passage to thereby elevate the temperature of the inert fill gas relative to room temperature.

7. The method of Claim 4 further comprising the step of heating at least a portion of the outer lamp jacket during the step of sealing the tubular passage to thereby elevate the temperature of the inert fill gas relative to room temperature.

8. The method of Claim 3 wherein the temperature of the fill gas is reduced relative to room temperature at the time the space enveloped by the outer lamp jacket is hermetically sealed so that the pressure of the fill gas will be superatmospheric at room temperature.

9. The method of Claim 8 further comprising the step of cooling at least a portion of the outer lamp jacket during the step of sealing the tubular passage to thereby reduce the temperature of the inert fill gas relative to room temperature.

10. The method of Claim 1 wherein the composition of the flush gas and the fill gas are substantially the same.

11. The method of Claim 1 wherein the flush gas and the fill gas are inert.

12. The method of Claim 1 wherein the fill gas comprises one or more gasses from the group consisting of neon, argon, krypton, xenon, and nitrogen.

13. The method of Claim 1 including the steps of introducing a predetermined amount of a reactive flush gas into the space enveloped by the outer lamp jacket and elevating the temperature of the flush gas above a predetermined temperature for a predetermined amount of time.

14. The method of Claim 1 wherein the fill gas includes a reactive gas.

15. The method of Claim 1 wherein the flush gas is dispensed into the space at a rate at least about one tenth of one standard cubic foot per hour but not greater than about one hundred standard cubic feet per hour.

16. The method of Claim 15 wherein the flush gas is dispensed into the space for a period of not more than about fifteen minutes but not less than about five seconds.

17. In a method of making a lamp having a gas filled outer lamp jacket sealed at a single open end thereof to a lamp stem, the method including the steps of removing the ambient gas from the space enveloped by the outer lamp jacket, filling the space with an inert fill gas, and then hermetically sealing the space, the improvement wherein the ambient gas is removed from the space by introduction of a flush gas into the space through a tubular opening in the lamp stem to thereby displace the ambient gas from the space.

18. The method of Claim 17 wherein the flush gas is introduced into the space by inserting the gas dispensing end of a gas dispensing probe into the space through a generally tubular passage through the lamp stem and dispensing the flush gas therefrom.

19. The method of Claim 18 wherein the gas dispensing probe is inserted into the space substantially along the longitudinal axis of the lamp.

20. In a method of making a lamp having a gas filled outer lamp jacket sealed at a single open end thereof to a lamp stem, the method including the steps of removing

the ambient gas from the space enveloped by the outer lamp jacket, filling the space with an inert fill gas, and then hermetically sealing the space, the improvement wherein the ambient gas is removed from the space without a mechanical pump.

21. In a method of making a lamp including the steps of flushing and filling the space enveloped by the outer lamp jacket with a fill gas through a tubular passage in the lamp stem, the improvement wherein the fill gas is introduced into the space by a gas dispensing probe extending through the tubular passage so that the fill gas is dispensed from the probe into the space.

22. In a method of making a lamp having a gas filled outer lamp jacket wherein the pressure of the gas is other than atmospheric pressure at substantially room temperature, the method including the steps of flushing and filling the space enveloped by the outer lamp jacket with a fill gas and then hermetically sealing the space, the improvement comprising the step of maintaining the temperature of the fill gas at a predetermined temperature above or below room temperature while the space is sealed so that the pressure of the fill gas will be other than atmospheric pressure when the temperature of the fill gas is substantially room temperature.

23. A method of making a lamp wherein the outer lamp jacket envelopes fill gas at subatmospheric pressure at substantially room temperature, said method comprising the steps of:

elevating the temperature of the fill gas in the space enveloped by the outer lamp

jacket relative to the temperature of an uncontrolled atmosphere surrounding the lamp at substantially atmospheric pressure while maintaining communication between the fill gas and the surrounding atmosphere;

controlling the elevated fill gas temperature in a predetermined temperature range;
and

hermetically sealing the outer lamp jacket while the temperature of the fill gas is within the predetermined temperature range so that the pressure of the fill gas sealed within the space enveloped by the outer lamp jacket will be subatmospheric when the temperature of the fill gas is no longer elevated.

24. In a method of making a lamp including the steps of introducing lamp fill gas into the interior of the outer lamp jacket through an open tubular passage through the lamp stem and then forming a seal in the tubular passage to thereby hermetically seal the interior of the outer lamp jacket from the surrounding atmosphere wherein the pressure of the fill gas sealed within the interior of the jacket is other than atmospheric pressure at substantially room temperature, the improvement wherein there is no pressure differential between the pressure of the fill gas and the pressure of the atmosphere surrounding the lamp at the time the interior of the jacket is sealed.

25. The method of Claim 24 wherein the fill gas pressure in the lamp at substantially room temperature is subatmospheric.

26. The method of Claim 24 wherein the fill gas pressure in the lamp at

substantially room temperature is superatmospheric.

27. The method of Claim 24 wherein the open tubular passage through the lamp stem is substantially coaxial with the longitudinal axis of the lamp.

28. The method of Claim 27 wherein the step of introducing gas into the interior of the outer lamp jacket comprises the steps of inserting the gas dispensing end of a gas dispensing probe into the interior of the outer lamp jacket through the tubular passage and dispensing the gas therefrom.